

# **Comprehensive Nutrient Management Plan**

## **For**

### **Walnutdale Farms, LLC.**

**March 2008**

(with updates from 2009 and 2010)

## **Overview**

Walnutdale Farms is an existing dairy operation located at 4309 14<sup>th</sup> st. in Section 13 of Dorr Township in Allegan County. This is an incorporated family run farm owned by Kevin Lettinga. This farming operation is home to 1,100 cows weighing an average of 1,400 pounds, totaling 1,540 animal units. Animal units are based on one animal unit equaling 1,000 pounds of live weight. Calves born at the dairy are sent to satellite locations owned by Walnutdale, these facilities fall under a separate CNMP and land base.

Walnutdale is considering expansion of up to 230 head in the future. This CNMP will be updated and storages correctly designed and located prior to population of animals. This expansion does not have a time table at this time.

This CNMP will estimate crop acreage required to utilize the nutrients found in the manure produced at the dairy facility. This plan will also identify management, vegetative, and structural practices used to minimize the potential for adverse impacts on water quality and public health. This CNMP will be updated annually, unless a change of 10% or greater occurs in livestock numbers or notable changes in the land base available for application. If such a change occurs, the plan will be updated to include these new numbers and acreage.

## **Sampling and Calibration**

Walnutdale produces crops on 2,120 tillable acres, 1,868 of those acres are available for manure application based on soil test phosphorus levels (those having a value of less than 300lbs/acre using the Bray P1 test), field assessments and completed evaluations. Soil samples are based on crop history, soil types and management practices. Sampling zones are typically under 20 acres per sample (unless the soil type is the same and the field has been managed the same for 10 years) or have been GPS sampled in 2.5 acres grids. Soil tests are taken every third year and are used to make manure and fertilizer recommendations for the desired crops. Crops are grown include corn, wheat, and alfalfa.

Walnutdale has an agreement with County Line Farms (b) (6) Farm) where Walnutdale is purchasing feed produced on County Line's acreage and in return the land is available for Walnutdale to apply manure on. Currently 873 acres are available based on soil test results. Maps and information on these fields will be included in appendix five.

Manure samples are taken each spring during application to ensure that the sample represents the materials being applied.

Manure application equipment is calibrated by weighing the equipment full and empty and determining the amount of manure being applied, then performing an application to determine the area of application.

### Resource Concerns

Water quality concerns addressed in this CNMP are focused on ground and/or surface waters in the area surrounding the dairy facility and the fields managed by Walnuthdale. The Red Run Drain flows through several of the areas Walnuthdale farm in. A feeder drain to Red Run flows through the farm yard, this drain has been buried a piped under the production area. It now flows from the southeast corner of the production facility, underground to the northwest part of the facility where it comes out north of the parlor building and runs to the roadside ditch then on to Red Run Drain. Another area of offsite nutrient movement risk occurs during the land application of nutrients near surface waters. This plan, in association with proper management and training, will minimize the risk of nutrients entering surface or groundwater.

## Animal Outputs

### Animal Inventory

**Table 1. *Animal Inventory***

| <i>Animal ID</i> | <i>Animal Type And Production Phase</i> | <i>Animal Weight (Lb)</i> | <i>Number Of Animals</i> |
|------------------|---|---------------------------|--------------------------|
| Group 1          | Milk cow (dairy)                        | 1,400                     | 200                      |
| Group 2          | Milk cow (dairy)                        | 1,400                     | 200                      |
| Group 5 Steam up | Dry cow (dairy)                         | 1,450                     | 75                       |
| Group 8          | Milk cow (dairy)                        | 1,400                     | 160                      |
| Group 6&7        | Milk cow (dairy)                        | 1,400                     | 400                      |
| Fresh Cows       | Milk cow (dairy)                        | 1,375                     | 10                       |
| Group 15         | Milk cow (dairy)                        | 1,400                     | 45                       |
| Hospital Cows    | Milk cow (dairy)                        | 1,300                     | 10                       |

Cow groups as identified above are labeled on the site map. Calves born on the dairy facility are moved to offsite operations not part of this CNMP. The dry cows from this dairy are moved offsite when they go off lactation, they are brought back to the dairy facility just before calving (the steam up group).

The table below shows cow groups, where the manure will be stored and estimated annual production.

**Table 2. Manure Production and storage facilities.**

| Animal ID            | Animal Type And Production Phase | Animal Weight (Lb) | Number Of Animals | Animals Present From | Animals Present Through | Manure Collected (%) | Extra Water (Gal/Animal/Day) | Bedding (Lb/Animal/Day) | Notes    | Where Will Manure Be Stored? | Estimated Manure Production | Production Units |
|----------------------|----------------------------------|--------------------|-------------------|----------------------|-------------------------|----------------------|------------------------------|-------------------------|----------|------------------------------|-----------------------------|------------------|
| Group 1              | Milk cow (dairy)                 | 1,400              | 200               | Jan Early            | Dec Late                | 100                  |                              | 9                       | sand     | Pit 1                        | 1,298,000                   | Gal/Year         |
| Group 2              | Milk cow (dairy)                 | 1,400              | 200               | Jan Early            | Dec Late                | 100                  |                              | 9                       | sand     | Pit 2                        | 1,298,000                   | Gal/Year         |
| Group 5 Steam up     | Dry cow (dairy)                  | 1,450              | 75                | Jan Early            | Dec Late                | 75                   |                              | 9                       | sand     | Pit 3                        | 289,000                     | Gal/Year         |
| Lot runoff           | Milk cow (dairy)                 | 1,400              | 1,005             | Jan Early            | Dec Late                | 1                    | 0.2                          |                         |          | Pit 4                        | 138,000                     | Gal/Year         |
| Milk house wash      | Milk cow (dairy)                 | 1,400              | 1,005             | Jan Early            | Dec Late                | 1                    | 4.1                          |                         |          | Slurry Store #5              | 1,570,000                   | Gal/Year         |
| Group 8              | Milk cow (dairy)                 | 1,400              | 160               | Jan Early            | Dec Late                | 100                  |                              | 9                       | sand     | Pit 6                        | 1,038,000                   | Gal/Year         |
| Group 6&7            | Milk cow (dairy)                 | 1,400              | 400               | Jan Early            | Dec Late                | 100                  | 0.3                          | 9                       | sand     | Pit 7                        | 2,640,000                   | Gal/Year         |
| Storage              |                                  |                    |                   |                      |                         |                      |                              |                         |          | Pit 8                        |                             | Gal/Year         |
| Catch Basin          |                                  |                    |                   |                      |                         |                      |                              |                         |          | Catch Basin                  | 2,750,000                   | Gal/Year         |
| Group 5 Dry          | Dry cow (dairy)                  | 1,400              | 75                | Jan Early            | Dec Late                | 25                   |                              | 5                       | shavings | Group 5 Dry                  | 402                         | Ton/Year         |
| Fresh Cows           | Milk cow (dairy)                 | 1,375              | 10                | Jan Early            | Dec Late                | 100                  |                              | 10                      | straw    | Fresh Cows Dry               | 246                         | Ton/Year         |
| Group 15             | Milk cow (dairy)                 | 1,400              | 45                | Jan Early            | Dec Late                | 100                  |                              | 9                       | sand     | Pit 4                        | 292,000                     | Gal/Year         |
| Hospital Cows        | Milk cow (dairy)                 | 1,300              | 10                | Jan Early            | Dec Late                | 100                  |                              | 5                       | shavings | Hospital Cows                | 222                         | Ton/Year         |
| <b>Manure volume</b> |                                  |                    |                   |                      |                         |                      |                              |                         |          |                              | <b>8,563,000</b>            | <b>Gal/Year</b>  |
| <b>Catch Basin</b>   |                                  |                    |                   |                      |                         |                      |                              |                         |          |                              | <b>2,750,000</b>            | <b>Gal/Year</b>  |
| <b>Pen Pack</b>      |                                  |                    |                   |                      |                         |                      |                              |                         |          |                              | <b>870</b>                  | <b>Ton/Year</b>  |

**Nutrient Production:**

The annual phosphorus production for Walnutdale has been determined by using mass balance analysis. This method of determining phosphorus production considers the feed ration (amount of feed, and P concentration in that feed) the amount of phosphorus removed in milk production, and the amount of phosphorus removed in calves. Based on feed inputs and milk production at Walnutdale Dairy, the **estimated P2O5 produced at this location is 124,796 pounds per year** (mass balance analysis can be found in appendix 4). The crop removal rate per acre on land that Walnutdale manages for crop production is 70.0 lbs/acre; using this rate of removal a sustainable operation would need 1,783 acres. Walnutdale Dairy currently manages 2,120 acres and has relationships with area growers who utilize manure produced at the dairy; based on the additional acreage

from area growers, this is a sustainable operation. Offsite manure applied in 2006 was nearly one million gallons and the offsite manure applications for 2007 were over three million gallons. Fertilizer prices and other factors have resulted in an increased interest in receiving manure applications from the dairy for other area farmers over the last few years. Manure transferred offsite is recorded and the appropriate data is collected and retained by Walnutdale farms.

### **Maps of Production Area**

Maps showing the dairy facility can be found in Appendix 1.

### **Production Area Conservation Practices**

Cattle are under cover with the exception of the alleyways between the barns and the milking parlor. The runoff from alleys is collected in the manure pits or in the catch basin. The collection basin was designed by NTH Consultants and installed in 2006 to collect the lot runoff from the silage pad and areas that manure may come into contact with. The liquid is collected and land applied with an irrigation gun according to nutrient load and crop yield goals.

### **Manure Collection and Storage**

#### **Collection**

Liquid manure from free stall barns is scraped daily with a uniloader directly into the storage facilities. Pits are emptied with a transfer pump and moved to the manure to the storage pit (pit #8) or loaded into a tanker or manure spreader and then land applied at agronomic rates. Liquid manure is applied using one of the following:

- Houle Spreader (injected or surface apply) 7,300 gallons
- Knight Slinger (liquid) 2,900 gallons
- Semi Tanker 7,500 gallons
- Balzer Spreader 5,500 gallons
- Irrigation (Pull)

Dry manure is pen packed for one month and land applied with one of the following:

- Knight Slinger (dry) 16 tons
- Meyer Spreader 15 tons
- John Deere Box Spreader (hydro-push) 2 tons

All Manure storage structures are outdoors and without covering. Pits 1-3 and 6-8 receive manure with sand bedding. Pits 4&5 do not collect any bedding.

### **Manure Storage Facility Information**

NPDES manure storage requirements:

Part 1. Section A. 4.

- a. "All CAFO waste generated from the operation of the CAFO in a six month or greater time period (including normal precipitation and runoff in the production area during the same time period). This is the operational volume of the storage structure" (from MIG019000 NPDES Permit).

Based on calculations that can be found in appendix nine, Walnutdale has 157 days of manure storage when there are 1,100 cattle present. During engineering reviews, the Pit #8 (the storage pond) will be re-assessed to determine the capacity of this structure. After the construction of pit #8, the catch basin has been installed and the majority of the contaminated runoff is being diverted into the catch basin. This information will be submitted with the storage review.

- b. “For cattle, horses, and sheep, and existing swine, poultry, and veal facilities, all production area waste generated from the 25-year 24-hour rainfall event.”  
Manure storage calculations were performed including the 25 year 24 hour rainfall event. Supporting information can be found in appendix nine.
- c. “An additional design capacity of a minimum of 12 inches of freeboard for storage structures that are subject to precipitation caused runoff. For storage structures that are not subject to precipitation-caused runoff, the freeboard shall be a minimum of 6 inches.”

All manure storage calculations have included the 12 inch freeboard level. Appropriate storage level is monitored during storage inspections using the pit markers (manure storage inspection forms can be found in appendix five).

Walnutdale Farms is in the process of having the manure storage facilities reviewed by professional engineers to verify that the storage structures meet the NRCS 313 standard. If it is determined that the storage structures do not meet the standard, mitigating actions will be developed and executed. As built documentation on the catch basin structure, located to the northeast of the farm, and the liquid storage structure to the east of the farm (pit #8), will be submitted to the DNRE for review.

### **Description of Manure Storage Structures and Facilities**

(Pit documentation and design information can be found in Appendix 9 in the Storage section).

**Pit #1:** Pit #1 is a reinforced concrete pit measuring 55' x 35' x 6' with a 36' long 6:1 ramp. The usable volume of this pit is 76,782 gallons, allowing one foot of freeboard and six inches for a 25 year, 24 hour storm event. Storage time for this structure is 16.7 days. Manure from this pit is produced by the Group 1&2 Cows. This structure was constructed in 1998 with assistance from the NRCS.

**Pit #2:** Pit #2 is a reinforced concrete pit measuring 55' x 35' x 6' with a 36' long 6:1 ramp. The usable volume of this pit is 76,782 gallons, allowing one foot for freeboard and six inches for a 25 year, 24 hour storm event. Storage time for this structure is 16.7 days. Manure from this pit is produced by the Group 3&4 Cows. This structure was constructed in 1998 with assistance from the NRCS.

**Pit #3:** Pit #3 is a reinforced concrete pit measuring 40' x 25' x 6' with a 36' long 6:1 ramp. The usable volume of this pit is 42,569 gallons, allowing for one foot of freeboard and six inches for a 25 year, 24 hour storm event. Storage time for this pit equals 65.9

days. Manure from this pit is produced by the Group 5 cows. The Group 5 cows spend half of their time on sand bedding and half on sawdust only 50% of the estimated manure production is used to determine the storage time for this structure. The remaining manure produced by the Group 5 cows is pen packed and handled as dry manure and land applied monthly. This structure was constructed in 1998 with assistance from the NRCS.

**Pit #4:** Pit #4 is a reinforced concrete structure measuring 60' x 20' x 8'. The usable volume of this pit is 48,261 gallons, allowing for one foot of freeboard and one foot for a 25 year, 24 hour storm event. Storage time for this pit is estimated at 20.0 days. Material in this pit is from the milk house and parlor wastewater, as well as lot runoff from the barnyard (60' x 92') and the east section of the Group 5 barn (25' x 92'). It is estimated that this pit was constructed in 1974 by the Star Company.

**Slurry Store (Pit #5):** The slurry store is a glass lined prefabricated slurry store measuring 25' high and 80' across. The usable volume of this pit is 848,726 gallons, allowing for one foot of freeboard and six inches for a 25 year, 24 hour storm event. Storage time for this structure is 180.3 days. Manure in this storage structure is pumped from Pit #4. It is estimated that the A.O. Smith Harvestore Products, Inc constructed this structure in 1976.

**Pit #6:** Pit #6 is a reinforced concrete pit measuring 42' x 34' x 6' with a 36' long 6:1 ramp. The usable volume of this pit is 60,117 gallons allowing for 1.5 feet of freeboard. Storage time for this structure is 16.1 days. Manure from Group 8 is collected in this structure. This storage structure was constructed in 1998 with assistance from the NRCS.

**Pit #7:** Pit #7 is a reinforced concrete pit measuring 44' x 44' x 6' with a 36' long 6:1 ramp. The usable volume of this pit is 80,679 gallons, allowing for 1' freeboard and six inches for a 25 year, 24 hour storm event. Storage time for this structure is 8.8 days. Manure from this pit is produced by Groups 6&7.

**Pit #8:** Pit #8 is a rubber lined storage structure measuring 310' x 250' with an access ramp. The usable volume of this pit is calculated at 3.9 million gallons, allowing for one foot freeboard and six inches for the 25 year, 24 hour storm event. Storage time for this structure was estimated at 180 days when NTH helped construct it. NTH Consultants, Ltd. calculated the total usable volume for this structure when it was designed (See appendix 9). This pit was designed as the storage structures for manure from the other pits during winter or while the crops are in the field. The storage time for this structure was based on the total production of the farm. NTH Consultants provided a storage evaluation which is located in appendix 9.

\*The usable capacity of pit #8 has increased since the construction of the catch basin in 2006. Runoff water that was previously collected in pit #8 now flows into the catch basin. When manure storages are reviewed, new calculations will be run to determine the new usable capacity. If the previous 3.9 million gallon volume is used, this pit will hold 137 days of the entire farm production.

**Catch Basin:** A catch basin designed by NTH Consultants was installed in 2006 for the purpose of collecting contaminated lot run-off and silage leachate. This storage structure has an estimated capacity of three million gallons. The liquid collected in this storage structure is applied using an irrigation gun. As built documentation for this manure storage structure have been requested to documents construction practices. The storage capacity of this structure is estimated around 1.5 million gallons, 160 days of runoff storage.

Markers have been installed in all the pits. These markers indicate the level of freeboard left in the structures.

All pit calculations can be found in appendix 9.

**Fresh Cow Barn:** Dry manure produced in the fresh cow barn, by the steam up group, and from half of the Group 5 cows. This manure is pen packed for one month, then loaded out and land applied according to field nutrient needs.

#### **Manure Storage Inspections and Operations & Maintenance Plans:**

Manure storage structures at Walnuthdale will be inspected weekly using the inspection form found in appendix five. This inspection will record the storage structure ID, date, Estimated freeboard, evidence of cracks, erosion, if there was an overflow, weather the structure requires maintenance and the state of the vegetation surrounding the structure (if applicable), as well as any other comments and the initials of the inspector.

- In the event that the level of waste in the structure exceeds the maximum operational level, and enters the emergency level, actions will be taken to reduce the level of waste in the structure by transferring it to another pit. If the level of waste in the structure cannot be reduced by transferring waste, the DNRE shall be notified. Application of waste in accordance with the permit shall be used until the emergency volume is restored. Any time DNRE notification is required, it will be recorded in the inspection records at the farm.
- At a point between November 1 and December 31 of each year, there will be a minimum of six months of operational storage available. The date of this occurrence will be documented using pit levels and recorded with inspection forms.
- Vegetation will be monitored to ensure proper visibility of pit markers, safety of operation, and visibility of the structural integrity and to prevent erosion. Vegetation will be present where appropriate and maintained at a level where the integrity of the storage structure will not be compromised (i.e. trees will not be allowed to grow on the dirt edges of a structure).
- Any damages caused by erosion, slumping or animal burrowing will be corrected immediately and preventative actions will also be taken.
- The integrity of the structure will be protected. Any issues will be addressed and actions recorded.
- Manure transfer equipment and other plumbing lines will be inspected using the forms in appendix five. Any problems with transfer equipment will be addressed

and recorded. If a problem is not corrected within 30 days, an explanation of the factors causing the problem must be documented with inspection records.

- Waste produced at the Walnuthdale facility will be stored in the appropriate structures or managed in pen pack prior to application and transfer of manure.

## **Walnuthdale Farm Management Practices**

Walnuthdale utilizes best management practices when available or possible with their management programs. The items listed below are management practices used at the Walnuthdale facility.

### **1. Conservation Practices:**

- a. Walnuthdale has two small pastures located to the north of the dairy facility. These pastures are managed to provide forage for cattle. When heavy use areas develop, or vegetation becomes scarce, the cattle will be fenced off that area, and vegetation will be reestablished to reduce erosion concerns. Pasture management will be recorded on forms found in appendix five.
- b. Water Supply: Wells located at this facility are identified on the site map in appendix one. All wells are located to the west of the cattle barns at acceptable distances from the manure storage structure and production facilities. Well isolation distance worksheets and copies of the well logs are located in appendix nine.

### **2. Divert Clean Water:** Clean water diversion reduces the volume of waste that Walnuthdale needs to manage. Diverting clean water protects surface waters and reduces waste management costs for Walnuthdale.

- a. Feed Storage:
  - i. Haylage is bagged and stored on the asphalt pad on the south end of the farm. During the summer of 2008 Walnuthdale worked with CJD consulting to develop a series of diversion berms and blocks that allows farm managers to collect only the water that comes into contact with the exposed feed surface. When the feed bags are not open, the clean water is diverted into the drain running near the farm.
  - ii. Silage is stored on the silage pad on the east side of the farm on a covered pile (see site map and overview). This pile remains covered year round. All leachate from the silage pile collected in the catch basin.
  - iii. Commodities are stored in the commodity shed that is located to the west of the silage pad. Any potential runoff from the commodity shed is also collected in the catch basin.
  - iv. Feed Refusal is estimated at a rate of 3% per day. All refused feed is fed to heifers at the offsite locations (the feed refusal rate is an estimate from the producer).
- b. Clean water is diverted from building roofs by using gutters on some structures and with drains that prevent clean water from contacting areas



that may have manure or feed spilled on them. Roof Gutters are used to divert clean water from coming into contact with walkways that have manure present.

- c. Plate Cooler Water: All water from the plate coolers is recycled as drinking water for the cows and is also used to wash down the parlor.
- d. Feedlot run-off: There are no feedlots on this farm; there are walkways between buildings that the cattle take from barn to parlor. This walkway is in front of groups 6, 7&8 and on the barns to the south of the parlor. The runoff from these areas is collected in the catch basin or in pit #4. Cattle remain under cover in all other areas.

### 3. **Prevent Direct Contact of Animals with Waters of the State:**

- a. Walnutdale has the two small pastures to the north of the dairy facility that are stocked lightly and are managed to keep an appropriate amount of vegetation on them. Fencing around the perimeter of the pasture prevents direct access of animals to the drain running along the pasture. The area between the parlor facility and the south end of the pasture is not pastured. This area is where the drain surfaces from the south side of the farm. Livestock will not be allowed to enter this area.

### 4. **Animal Mortality:**

- a. Animal Mortalities are picked up by a local rendering company. Mortalities and disposal are recorded on a form included in appendix five.

### 5. **Chemical Disposal:**

- a. The chemicals present at Walnutdale are petroleum products (fuel, oil and other shop items), foot bath chemicals for the cows, and feed treatment additive for ensiling. Walnutdale does not apply any pesticides to their own fields. Walnutdale will prevent any improper chemical disposal from occurring.
  - i. The proper fuel tanks are used to store fuel on the south side of the shop building.
  - ii. All oils, greases and other mechanical type chemicals will be disposed of according to the labeling or legal requirements.
  - iii. All foot and feed treatments will be handled as required in the product labeling and stored in the appropriate locations.
  - iv. Veterinary Wastes: Needles and other veterinary wastes are stored in a “sharps” container (a designated, hard, plastic container) and hauled to a landfill by a licensed waste hauler.

**Milk house and Parlor Wastewater:** Wastewater from both the milk house and parlor are stored in Pit #4. From there the contents of the pit are piped in to the slurry store (storage #5). Estimates for annual wastewater production are found in table 2, detailing the manure production for the farm (found on page 3).

### **Manure Transfer:**

Liquid manure is loaded directly into land application equipment or loaded into semi tankers that transfer the manure to a liquid manure spreader at the fields. Dry manure is

hauled to the field with a tractor drawn box spreader, slinger spreader or using rented equipment (a slinger box mounted on a straight truck).

**Odor Management:** Manure is handled with care and prevented from getting onto roadways to reduce odor issues. Manure produced at this facility is injected when possible and incorporated when tillage practices allow. Manure applications are made with care concerning neighboring residences, weekends, holidays and other high use times are avoided when possible.

**Non-Production Area Storm Water Management:**

Walnutdale implements practices including preventative maintenance, good housekeeping and periodic inspections at least once a year to minimize and control pollutants in storm water discharges associated with the following areas:

- a. Drive ways and access roads, they are monitored for pollutants and dust control measures are used when appropriate.
- b. Sites used for handling materials other than CAFO wastes. The shop is kept clean and safe for users, oil and other contaminants are cleaned to prevent pollution.
- c. Refuse sites are kept clean and dumpsters serviced regularly to prevent odors or pollution.
- d. Sites used for storage, the shop or hay barn to the east are monitored for oil spills and general cleanliness. The haylage pad is also used to park equipment on; this area is also monitored to prevent oils or other debris from entering waters of the state.
- e. All shipping and receiving areas are kept clean to prevent pollution and for safety.

**Land Application of CAFO Waste:**

**A. Field-by-field Assessment:**

- a. All fields that are planned to receive manure applications will have an assessment done, and submitted to the DNRE for approval prior to receiving manure applications. The assessment will include slopes, soil types, locations of tile outlets and risers, tile depth, conservation practices, and offsite conditions such as buffers, and distance or conveyance to surface waters. It will also identify areas that have potential for erosion due to topography, activities or other factors.
  - i. Winter applications can be made only to fields that have been assessed to identify fields or sections of fields that can be used for surface application of CAFO waste without incorporation to frozen or snow covered ground, in accordance with the DNRE 2005 Technical Standard for the Surface Application of CAFO Waste on Frozen or Snow Covered Ground without Incorporation or Injection.
    1. Winter manure applications at Walnutdale Dairy are from pen-packed manure from the fresh cow barn and the steam

up group. These groups are bedded with a straw or sawdust pack. Manure is cleaned and hauled to the fields in manure spreaders for direct land application when conditions are appropriate or are stockpiled in the fields until the conditions allow application to take place. When manure is stockpiled in the field dirt is bermed against it to prevent any run-off. Dry manure is land applied to fields that have slopes less than six percent during the winter.

2. Due to changes in field tiles, and new crop rotations, new fields inspections will be conducted to determine suitable winter application areas in fields. This assessment will be completed and submitted by December 1, 2010.

#### B. Field Inspection Prior to Land Application

- a. Manure analyses are included in this plan (appendix four) and are taken annually. These samples are taken during manure application; this ensures representative samples are taken that reflect the manure being applied. Samples are recorded and submitted as required.
- b. Soil Sampling:
  - i. Nutrient management for crop production is based on current soil tests. Soil testing occurs every three years for each field. The samples have been taken to represent approximately 20 acres or smaller and are taken at a depth of 8-10" (the tillage depth). Fields that have sample zones larger than 20 acres have been farmed and managed the same for many years. Phosphorus test is done using Bray P1 Testing.
  - ii. Composite samples have been taken according to MSU guidelines and are done in a zigzag pattern across the field.
  - iii. GPS sampling has also been used by Walnutdale for more specific fertility management. Fields that have been sampled using gps were done using 2.5 acre grids.
  - iv. Results from all soil sampling can be found in appendix three. A soil test report summary lists the fields and soil tests results in lbs/acre (KISS form). Following the summary are the GPS maps showing phosphorus levels for fields that have been grid sampled.
- c. Prior to land application of CAFO waste, fields will be inspected within 48 hours of the application occurring. These records will be recorded on the daily manure application form in appendix five. This inspection will document state of all tile outlets, evidence of soil cracking, the moisture holding capacity of the soil, crop maturity and the condition of designated conservation practices (i.e. grassed waterways, buffers, and diversions). The DNRE Daily land application log will be used to record this data and can be found in appendix five.
- d. Immediately prior to land application, the tile outlets will be inspected, and at the end of the working day, they will be inspected again to verify that manure is not leaving the field through tiles. This observation is done

by seeing if the color of the liquid flowing from the tile is different than the start of the shift/day and the odor from the tile.

- e. All fields that received waste applications within the previous 30 days will be inspected within 24 hours after the first rainfall event of ½ inch or greater for signs of discharge of waste. This inspection shall be recorded on the daily application form. If an inspection reveals a discharge, the DNRE shall be contacted immediately in accordance with the NPDES permit. If such an event occurs, it will be documented appropriately.
- f. The land application equipment shall be inspected daily during use and recorded on the daily application log.

C. Maximum Annual Land Application Rates:

- a. Nutrient removal is an essential part of managing manure produced at Walnutdale Dairy.
- b. ***Crop Nutrient Removal Rates.*** *The yields below reflect achievable yields on different fields. Soil types and past yields are used to determine yield goals.*

**Uptake:**

| Crop               | 2010 Acres | Yield Goal Per Acre<br>(tons/bushel) | Estimated Crop Nutrient Removal<br>(using GAAMPs values below) |                |                |
|--------------------|------------|--------------------------------------|--|----------------|----------------|
|                    |            |                                      | Total N<br>(lb)  | P205<br>(lb)   | K20<br>(lb)    |
| Corn-silage (tons) | 1066       | 20                                   | 200,408  | 70,356         | 170,560        |
| Corn-silage (tons) | 170        | 16                                   | 25,568   | 8,976          | 21,760         |
| Corn-grain (bu)    | 268        | 150                                  | 36,180   | 14,874         | 10,854         |
| Alfalfa (tons)     | 60         | 3                                    | 8,100  | 2,340          | 8,100          |
| Alfalfa (tons)     | 0          | 4                                    | 0  | 0              | 0              |
| Alfalfa (tons)     | 0          | 5                                    | 0  | 0              | 0              |
| Alfalfa (tons)     | 315        | 6                                    | 85,050   | 24,570         | 85,050         |
| Alfalfa (tons)     | 300        | 7                                    | 94,500   | 27,300         | 94,500         |
| Wheat-grain (bu)   | 0          | 80                                   | 0  | 0              | 0              |
| Wheat-straw (tons) | 0          | 1.5                                  | 0  | 0              | 0              |
| Soybeans (bu)      |            | 40                                   | 0  | 0              | 0              |
| <b>Totals:</b>     |            |                                      | <b>449,806</b>   | <b>148,416</b> | <b>390,824</b> |

Dairy Facility  
From Manure  
Mgmt.  
GAAMPs, 2004,  
pg.28

**2119**

**70.041 lbs/acre**

**Pounds of Nutrient Removed per Unit:**

| Crop            | Unit | Avail-N | P205 | K20  |
|-----------------|------|---------|------|------|
| Corn-silage     | tons | 9.4     | 3.3  | 8    |
| Corn-grain      | bu   | 0.9     | 0.37 | 0.27 |
| Alfalfa         | tons | 45      | 13   | 45   |
| Alfalfa Haylage | tons |         | 3.2  |      |
| Wheat-grain     | bu   | 1.2     | 0.63 | 0.37 |
| Wheat-straw     | tons | 13      | 3.3  | 23   |
| Soybeans        | bu   | 3.8     | 0.8  | 1.4  |

As stated before phosphorus production is estimated at 124,796 lbs per year and the phosphorus removal of crops grown by Walnutdale is estimated at 118,140 lbs

per year. The following table shows the crop nutrient removal for Walnutdale based on the 2010 crop plan.

Manure applications are made based on manure nutrient content, soil test results, past crops, planned crops, management practices and yield goals. A detailed plan describing nutrients applied in the form of manure can be found in appendix four. This plan has been generated using the Purdue Manure Management Planner program.

- D. Land Application of all nutrients will be recorded.
  - a. CAFO Waste application will be recorded on the DNRE daily application log (or summarized from multiple applicators in the same field and transferred to a master daily application log).
  - b. Crop plan, yield goals and actual yields will be recorded also to ensure proper fertilization and nutrient utilization.
  - c. The methodology and calculations showing nutrient application rates can be found in the Crops vs. Application Rate chart in appendix four ahead of the manure samples. This is a quick reference chart that takes into account the planned crop, yield, type of application (inject, surface apply), source of manure, rate of application and gives credit for previous N sources (i.e. legume crops or prior year manure applications).
  - d. The application of all N&P to fields will be recorded.
    - i. Any application of commercial fertilizer done by Walnutdale employees will be recorded by Ken or Kevin Lettinga.
    - ii. Any custom application on Walnutdale fields will be recorded by the custom application company.
    - iii. A summary of these documents will be included in the annual report.
  - e. Description of weather conditions at the time of application, and for the 24 hours prior to and following the application based on visual observation.
  - f. Printouts of weather forecasts from the time of land application. Copies of the weather forecast are saved digitally by Kevin Lettinga on his computer in the office.
- E. Prohibitions of applications:
  - a. CAFO waste shall not be applied on land that is flooded or saturated with water at the time of application.
  - b. CAFO waste shall not be applied during rainfall events.
  - c. CAFO wastes shall not be surface applied without incorporation to frozen or snow-covered ground, except in accordance with the technical standard.
  - d. CAFO waste application shall be delayed if rainfall exceeding ½ inch or less, if a lesser rainfall event is capable of producing an unauthorized discharge, is forecasted by the National Weather Service during the planned time of application and within 24 hours after the time of planned application. Forecast models are the GFS MOX text forms for Grand Rapids MI, (KGRR).
- F. Methods of application: Prior to manure application the manure in the storage structures is agitated and then pumped into the application equipment. Manure

applications are performed by Walnutdale's employees who have been trained. Application is done using one of the pieces of equipment found on page four.

- a. Injection or incorporation may not be feasible in all crop rotations or practices (i.e. pastures, forage crops, wheat stubble, or no-till management). CAFO waste may be applied to these fields, but proper management must be done to ensure that waste does not move offsite. Application may not occur in situations where CAFO waste may, or is likely to enter the waters of the state.
  - b. On ground that is frozen or snow covered, CAFO waste may be applied and not incorporated within 24 hours *only* if there is a field-by-field demonstration in accordance with the 2005 Technical standard showing that the application can occur without the offsite movement of nutrients. Any application of CAFO waste to frozen or snow-covered ground is limited to one crop year of phosphorus removal.
- G. Setbacks: All setbacks shall be measured from the ordinary high water mark, where applicable, or from the upper edge of the bank if the ordinary high water mark cannot be determined. Sensitive areas for manure application are noted on color coded maps and are included in this plan in appendix two. Manure application maps and application log forms will be provided to all operators applying manure.
- a. CAFO waste shall not be applied closer than 100 feet to any ditches that are conduits to surface waters, surface waters, except for up-gradient surface waters, open tile line intake structures, sinkholes or agricultural wellheads.
  - b. The 100 foot setback can be reduced to 35 feet if a designated buffer is present. Waste may not be applied within this 35 foot buffer.
  - c. Waste shall not be applied within grassed waterways and swales that are conduits to surface waters.

## **Conservation Practices and Land Management**

### **Soil Related Issues:**

Included in this plan are current soil test results as well as Revised Universal Soil Loss Equation (RUSLE2) calculations and Manure Application Risk Index (MARI) evaluations for all fields. Field maps show sensitive areas with different colors signifying varying levels of sensitivity.

Fields with RUSLE2 values greater than the tolerable limit "T" for the specific soil type in will not receive manure applications without actions being taken to reduce the risk of offsite nutrient flow in the form of soil erosion. Fields with estimated rates of erosion that exceed the tolerable limit are listed below in Table 3.

**Table 3. *RUSLE2 evaluation results.***

### **Walnutdale Dairy 2008 Fields exceeding RUSLE2 Rates and Alternate crop plans**

| Field ID      | Acres      | Tolerable Rate |         | Predicted rate |         | Alternate crop rate |         |
|---------------|------------|----------------|---------|----------------|---------|---------------------|---------|
| H3            | 21         | 5              | tons/yr | 23             | tons/yr | 5                   | tons/yr |
| H4A           | 18         | 5              | tons/yr | 15             | tons/yr | 5                   | tons/yr |
| H4B           | 18         | 5              | tons/yr | 6.5            | tons/yr | 2.1                 | tons/yr |
| H4C           | 18         | 5              | tons/yr | 11             | tons/yr | 4.6                 | tons/yr |
| H4D           | 18         | 5              | tons/yr | 7.2            | tons/yr | 3.5                 | tons/yr |
| H8            | 14         | 5              | tons/yr | 5.9            | tons/yr | 3.1                 | tons/yr |
| ED21A         | 22         | 5              | tons/yr | 6.8            | tons/yr | 2.3                 | tons/yr |
| ED21B         | 22         | 5              | tons/yr | 9.7            | tons/yr | 3.2                 | tons/yr |
| K26A          | 30         | 3              | tons/yr | 9.9            | tons/yr | 2.9/.096            | tons/yr |
| EM28A         | 14         | 3              | tons/yr | 9.1            | tons/yr | 1.6                 | tons/yr |
| EM28B         | 14         | 5              | tons/yr | 7.6            | tons/yr | 4.2                 | tons/yr |
| UB37A         | 23         | 4              | tons/yr | 6.3            | tons/yr | 4                   | tons/yr |
| UB37B         | 23         | 4              | tons/yr | 6.3            | tons/yr | 4                   | tons/yr |
| MR39A         | 24         | 4              | tons/yr | 4.9            | tons/yr | 3.2                 | tons/yr |
| MR39B         | 24         | 4              | tons/yr | 4.9            | tons/yr | 3.2                 | tons/yr |
| N40B          | 16         | 3              | tons/yr | 5              | tons/yr | 1.5                 | tons/yr |
| Nov58A        | 19         | 5              | tons/yr | 5.8            | tons/yr | 2.5                 | tons/yr |
| MN61A         | 17         | 5              | tons/yr | 5.8            | tons/yr | 4.3                 | tons/yr |
| MN61B         | 16         | 5              | tons/yr | 15             | tons/yr | 4.3                 | tons/yr |
| MN61C         | 16         | 5              | tons/yr | 8.9            | tons/yr | 2.7                 | tons/yr |
| MN61D         | 33         | 5              | tons/yr | 8.9            | tons/yr | 2.7                 | tons/yr |
| C66           | 20         | 5              | tons/yr | 9.9            | tons/yr | 3.6                 | tons/yr |
| C67           | 17         | 5              | tons/yr | 16             | tons/yr | 4.5                 | tons/yr |
| C69           | 7          | 5              | tons/yr | 12             | tons/yr | 3.3                 | tons/yr |
| <b>Total:</b> | <b>464</b> | <b>acres</b>   |         |                |         |                     |         |

Walnutdale Farms uses conventional tillage, including chisel plow followed by a drag or finisher on most fields. If fields become compacted due to harvesting when soils are wet or from excessive traffic a deep ripper is used to improve soil structure. No till is also used when conditions allow. Minimum tillage practices increase the amount of residue left on the ground surface, thereby decreasing the rate of soil erosion by sheet runoff.

Fields with estimated rates of soil erosion exceeding the tolerable limit will have mitigating strategies applied to them to reduce the potential for soil movement offsite by water erosion. A detailed analysis for all field can be found in appendix six, this section also contains possible solutions that will bring the estimated rate of soil erosion below the tolerable limit (done by using high residue crops, no till and manure applications).

### Wind Erosion:

Wind erosion is one way that nutrients move offsite from the field into surface waters. The offsite movement of soil particle can carry nutrients and chemicals into these surface waters. The NRCS has developed an equation that helps estimate the rate of soil loss due to wind erosion on specific soil types. The factors for this equation include the distance that wind travels without any windbreaks, the surface residue, the tillage practice and the specific soil types.

Soil types are classified based on their tendency to be transported by wind erosion. The classification number is called the “I” value. Soils that have an I value exceeding 86 have been evaluated and the worksheets are included for each field in appendix eight.

**Table 4. Wind Erosion Equation Results**

| WEQ Data based on Current Crop Plan |       |                 |         |           |         |
|-------------------------------------|-------|-----------------|---------|-----------|---------|
| Field ID                            | Acres | Tolerable limit |         | Est. Rate |         |
| T-43                                | 13    | 4               | tons/yr | 4         | Tons/yr |
| T-44                                | 14    | 4               | tons/yr | 4         | Tons/yr |
| Nov-58A                             | 19    | 4               | tons/yr | 4         | Tons/yr |
| Nov-58B                             | 17    | 4               | tons/yr | 4         | Tons/yr |
| 17-5                                | 18    | 3               | tons/yr | 5.5       | Tons/yr |
| 17-6                                | 18    | 3               | tons/yr | 6.5       | Tons/yr |

Solutions that will be implemented on the fields that have an estimated rate of soil erosion exceeding the tolerable limit are seeding to alfalfa, reducing the tillage practices on these fields, adding wheat or other small grain crops that leave large amounts of residue in the fields. Other options include planting cover crops, seeding grass strips or tree lines to create wind breaks.

## Land Management and Nutrient Utilization

### Land Requirement:

Using the mass balance method of feed analysis and nutrient uptake, removal of nutrients in calves and milk production, the predicted phosphorus production in the form of manure is estimated at 124,796 lbs of P<sub>2</sub>O<sub>5</sub> per year. The average crop removal for the land base managed by Walnutdale Dairy is 63.6lbs/acre of P<sub>2</sub>O<sub>5</sub> per year. Using this removal number, in order to be a sustainable operation based on phosphorus utilization, the facility would need 1,962 acres. Walnutdale currently managed 1,857.1 acres for its dairy operation. Current soil tests show that 1,794.1 acres available for manure application (under 300lbs/acre). Calculations showing the phosphorus production and utilization can be found in appendix four.

Walnutdale is currently 104.9 acres short of having their phosphorus production equal to their phosphorus utilization. Walnutdale has worked with crop producers in the area for several years by supplying nutrients in the form of manure. Annually over one million gallons of manure have been utilized by area producers over the last several years. When manure is transferred offsite Walnutdale retains the appropriate documents and forms. This documentation includes a signed copy of the manifest form, a soil test showing that the field may receive manure applications and the planned crop that the manure is being applied for.



Walnutdale has an agreement with County Line Dairy in Caledonia to apply manure for crop production on County Line's fields. This is a small dairy that has a large land base that will benefit from manure applications. Maps of these fields and soil tests are included in appendix five. Records of manure applications for this farm will be retained with all other offsite utilization of nutrients.

#### **Nitrogen Leaching:**

Nitrogen leaching risk indexes are based soil types and the likelihood that the nitrogen will move downward through the soil and out of the root zone. This avenue for offsite nutrient movement is one that will be minimized by proper nutrient management and nitrogen utilization. The nitrogen leaching risk indexes show that Walnutdale manages ground that has 278 acres in the high risk category, 1,599 acres in the medium risk category and 18 acres in the low category.

Manure application done in accordance with the established setbacks concerning surface waters, tile inlets/outlets, wells and nearby residences will minimize the risk of nitrogen movement into sensitive areas. Timely incorporation and spreading when there is no forecasted significant precipitation events will also help reduce these risks.

Nitrogen management in crop production is very important and has significant impacts on yields and production costs. The availability of nitrogen from manure is a very important asset to Walnutdale. Corn production is being managed to minimize the amount of nitrogen applied without reducing the yield potential of the crop.

Manure applications are done prior to planting, when the previous crops have been removed. At planting Walnutdale uses a 28% base starter fertilizer and a pop-up fertilizer containing approximately thirty pounds of nitrogen. Ground that has not received manure for several years is managed using commercial nitrogen in the form of urea and a slow release nitrogen product that helps reduce the chance of nitrogen leaching and increase the uptake of N by the corn plant. Ground receiving manure applications are sampled using the Pre-side dress nitrogen testing process. The PSNT tests are analyzed and applications are made according to yield goals and available nitrogen in the soil from the previous crops and manure applications. Using the management practices listed above Walnutdale reduces the amount of nitrogen applied to fields and reduces the risk of leaching.

#### **Phosphorus Loading:**

Soils that are naturally high in phosphorus or have had heavy phosphorus loading (in the form of manure applications or from over applications of commercial fertilizers) many not have the capacity to attach additional phosphorus. Applying phosphorus to these soils may result in unattached phosphorus in the soil and the potential for offsite movement of this phosphorus. This soluble phosphorus is mobile and measures of control may need to be considered to reduce the potential for offsite movement.

Proper management of manure application will prevent phosphorus loading from occurring and reduce the likelihood of this offsite movement. Manure will be applied at agronomic rates depending on the management practices outlined in the nutrient budget.

Fields that have soil tests that are below 150lbs/acre can receive manure applications based on the nitrogen requirements of the planned crop.

Fields that have phosphorus levels between 150 and 300lbs may receive manure applications at one year of phosphorus removal (or two years removal but appropriate records must be maintained and not application made the following year, i.e. a corn/soybean rotation). A chart showing the manure source, planned crop and yield goal has been provided in appendix four that shows the rate of manure for each source and yield goals.

#### **Phosphorus Reduction:**

Soils that have phosphorus levels that are over 300lbs/acre cannot receive manure applications. Walnuthdale manages fields that have soil tests that exceed 300lbs per acre. These fields have been identified and will not receive manure (these are fields that are identified with red highlights on the application maps). These fields should be managed in a way to bring the nutrient level down. This will be accomplished by preventing further application of phosphorus on the field and by increasing the rate of nutrient removal in the form of harvested crops. The drawdown process is greater with increased yields and tonnage removal through intensive cropping and high yields but is a very slow process. Even with intense cropping plans, the soil test levels fall very slowly, the best way to deal with overloaded soils is to prevent them from reaching 300lbs/acre initially by using proper management.

## **Record of CNMP Implementation**

Records will be kept by Kevin Lettinga at the main farm, which is located at 4309 – 14<sup>th</sup> St. Wayland, Michigan 49348. Records will be retained in files and also submitted annually to the MDEQ in accordance with the NPDES permit issued to this facility. Annual summary of the data will be stored on computer as well as files. These records will be retained for five years and will include:

- Maps of fields
- Soil test reports
- Manure Volume Produced
- Manure nutrient analysis results
- Record of manure sold or given away with manifest forms and the associated records needed for offsite transfers of manure
- Dates of manure application
- Source and Rate of manure application
- Dates and rates of other nutrients applied

- Dates of incorporation
- Method of application
- Area of field application
- Weather conditions 24 hours before, during and after the application of manure
- Field conditions during applications of manure
- Recommended nutrient application rates
- Previous crops and yields in addition to current crops
- Plant tissue sampling and test results (when applicable)
- Pre-side dress nitrate test reports (when applicable)
- Inspection and maintenance records for application equipment
- Inspection logs for manure storage structure in accordance with the NPDES permits issued to the facility

## **Inspections, Operations & Maintenance, Training**

Included in this CNMP is a sample log sheet used to record the manure applications. Operators log each load they haul, the manure source, the type of spreader, field conditions, wind direction and the date with initials from the operator applying the manure. This form can be found in appendix five.

Inspections of all manure handling equipment will be done by the manure applicator before transport.

The structural integrity of each storage facility will be inspected by Ken or Kevin Lettinga or a trained employee. Storage inspections will be done weekly. A checklist has been provided in appendix five that will be recorded and submitted annually showing inspection of the structure and the monitoring of freeboard levels are being completed. Any issues with storage structures will be addressed as soon as possible in the appropriate manner.

All employees will be trained upon hire in the areas of manure spreading, equipment handling and operation, as well as equipment maintenance and calibration. Also, all new hires will be trained to apply manure according to the setbacks identified on the application maps avoiding sensitive areas.

### **Spreader Calibrations:**

Manure application equipment has been calibrated by determining the capacity of the application equipment (gallons or weight) and measuring the area that was covered when the manure was applied. Charts showing the area and volume applied can be found in appendix nine.

-John Deere Hydro-Push: this spreader was determined to apply manure at a rate of seven tons/acre. This spreader has the capability of changing the rate manure is unloaded at. A

chart in appendix nine shows how tractor speeds change the application rate based on a constant unload rate from the spreader itself. This chart also shows the rate of phosphorus applied.

-Knight 830 Side Slinger (Liquid/Solid): This spreader can apply liquid or dry manure. Walnutdale uses this spreader mainly as a semi-solid manure. Application was measured at a rate of 3,243 gallons/acre. This spreader also has the capacity for changing application rates by opening the door. A chart is included in appendix nine that shows application rates when the tractor speed is varied. Phosphorus rates are also included for manure sources.

-Houle 7300 Liquid Tank (direct inject): This 7,300 gallon manure applicator is equipped with an injector bar and was calibrated at a rate of 11,622 gallons/acre. Application rate can be adjusted by changing the speed of the tractor. Manure volume and nutrient rates can be found on the charts located in appendix nine.

-Houle 7300 Liquid Tank (surface apply): This 7,300 gallon manure applicator applied manure at a rate of 4,877 gallons/acre. Spreading rates with this tank can also be varied by speed. Application charts in appendix nine show the application rates vs. speed.

-Semi Tankers: Manure is transferred to the fields using these 9,000 gallon tanks and is applied using these tanks when conditions allow. These tankers are equipped with splash plates and have been measured at 6,670 gallons/acre when passes are overlapped and 3,400 gallons/acre when passes are not overlapped. Application charts can be found in appendix nine for these tankers.

-Meyer 7200 Dry: This spreader is used primarily for dry manure application and has a capacity of approx 2.5 tons (depending on manure density). The Meyer spreader has been calibrated at a rate of five tons/acre. Application charts can be found in appendix nine.

## **Schedule of Implementation**

This Comprehensive Nutrient Management Plan will be implemented July 1, 2008 and updated annually based on manure tests, soil tests and crop plan. Any changes greater than 10% in livestock or land base will merit a revision and recertification of this CNMP.

Items requiring implementation:

- Following the fire in early July 2010, the Parlor building was destroyed. Walnutdale is in the process of gathering information and making plans for rebuilding. As directions are set and plans confirmed the CNMP will be updated accordingly.
- Soil and manure tests will be taken as required by the NPDES Permit. Application maps will be updated if they need to be.

- Fields without assessments will have basements completed and submitted to the department prior to land application occurring.
- Manure Application equipment will be re-calibrated when fall harvest of crops begins.

### **Emergency Action Plan**

Anticipated flow paths are shown on the site map for this location. In the event of a spill, it is required that the flow of nutrients be stopped as soon as possible to prevent them from reaching surface waters.

Runoff from the farm is collected in the catch basin thereby reducing the risk for offsite manure flow.

In the event of a spill, material would follow the runoff flow identified on the site map and the overview map. Spills or overflows of storage structures must be stopped as soon as possible to prevent nutrients from reaching surface waters.

#### **Breach of Manure Storage:**

1. Attempt to dam or berm any spill from entering surface water.
2. Pump manure from storage and transfer it to another storage structure or land apply it at agronomic rates if possible.
3. Remove manure from the discharge area.
4. Contact Ken or Kevin Lettinga.
5. Call the MDEQ Pollution Alert System at 1-800-292-4706.
6. In the event that a county drain or creek is affected, contact the Allegan County Drain Commissioner at 1-269-673-0440.
7. Record any uncontrolled discharge or wastewater that warranted emergency action response to the MDEQ Water Quality Division.

#### **Manure Spill on Roadways:**

1. Stop any additional spill.
2. Build a containment dam and remove manure.
3. Contact Ken or Kevin Lettinga.
4. Contact the local road commission and drain commissioner.
5. Contact the county sheriff.
6. Wash manure off the road under advisement.
7. Call the MDEQ Pollution Alert System at 1-800-292-4706.

#### **Manure Spill in Fields:**

1. Stop manure application.
2. Build containment dams.
3. Contact Ken or Kevin Lettinga.
4. Collect manure and apply at agronomic rates.

#### **Runoff of manure from Field:**

1. Stop manure application.

2. Plow a diversion trench to prevent offsite movement.
3. Contact Ken or Kevin Lettinga.
4. Remove manure and land apply at agronomic rates.

**Manure spill while loading from storage structures:**

1. Turn off loading or agitation equipment.
2. Collect manure and pump it into storage or application equipment.
3. Contact Ken or Kevin Lettinga.

**Notes:**

- In the event that a county drain or creek is affected, call the Allegan County Drain Commissioner at 1-269-673-0440.
- Record and report any uncontrolled discharge of wastewater that warranted emergency response to MDEQ Water Quality Division.
- Leaking or malfunctioning equipment should be kept away from ditches, streams and all channels to surface waters. Equipment not operating as designed should be taken out of service immediately and repaired before further use.
- Record all spills.

## Emergency Numbers

(b) (6)

|  |                       |
|--|-----------------------|
| <b>MDEQ Pollution Alert System</b>       | <b>1-800-292-4706</b> |
| <b>MDEQ Kalamazoo Office</b>             | <b>1-269-567-3500</b> |
| <b>MDEQ Grand Rapids Office</b>          | <b>1-616-356-0500</b> |
| <b>Allegan County Drain Commissioner</b> | <b>1-269-673-0440</b> |

**References:**

- Midwest Plan Services – 18 Section 1 “Manure Characteristics”
- Generally Accepted Agricultural Management Practices for Manure Management and Utilization, MDA March, 2008.
- MSU Extension – Crop Advisory Team Alert, “Winter Spreading: Keeping Manure Nutrients in the Field and Out of Surface Waters,” October, 2003
- Manure Management Systems Program Developed by Purdue University
- RUSLE2, NRCS Program

**Appendices:**

1. Appendix One
  - Site map
  - Overview Map with photo.

2. Appendix Two
  - Application Maps
  - Soil Survey maps
3. Appendix Three
  - Soil Test Summary (KISS sheet)
  - GPS Soil Test Maps
  - Crop Plan for 2008
  - Nutrient Balance Sheet – Crop plan and fertility recommendations
4. Appendix Four
  - Manure Test Results
  - Mass Balance Documents
  - Crop Removal vs. Phosphorus Production sheet
  - Manure Calendar and Plan
  - Manure Rates vs. Planned Crops Sheets (phosphorus and nitrogen)
5. Appendix Five
  - Manure Application Logs
  - Manure Storage Inspection Logs
  - Manure Equipment Evaluations
  - Mortality Records Form
  - Manifest Form
  - Manure Sale Log
  - County Line Farms (Seif Farms) Maps and Soil Test Results
6. Appendix Six
  - RUSLE2 Evaluations and alternate crop plans
7. Appendix Seven
  - MARI Evaluations
8. Appendix Eight
  - Wind Erosion Equation Results
9. Appendix Nine
  - Pit Evaluation letters
  - Storage calculations for manure storage structures
  - Spreader Calibration Forms
  - Well Isolation Documents and Well Logs